FLIGHT

The AIRCRAFT ENGINEER & AIRSHIPS

First Aero Weekly in the World.

Founder and Editor : STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

No. 740. (No. 9, Vol. XV.) MARCH 1, 1923 [Weekly, Price 6d. Post free, 7d.

Flight

The Aircraft Engineer and Airships

Editorial Offices : 36, GREAT QUEEN STREET, KINGSWAY, W.C. 2

Telegrams : Truditur, Westcent, London. Telephone : Gerrard 1828

Annual Subscription Rates, Post Free :

United Kingdom .. 30s. 4d. Abroad .. .. 33s. 0d.*

These rates are subject to any alteration found necessary under abnormal conditions and to increases in postage rates

* *European subscriptions must be remitted in British currency*

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DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list :

Mar. 1	**Lecture, "Helicopters," by Major F. M. Green, before R.Ae.S.**
Mar. 1	**Entries close for the Schneider Cup**
Mar. 15	**Entries close for Dutch Height Indicator Competition.**
Mar. 15	**Lecture, "The Control of Aeroplanes at Slow Speeds," by Professor B. Melvill Jones, before R.Ae.S.**
Mar. 23	**Entries close for Gordon Bennett Balloon Race**
Apl. 12	**Lecture, "Some Controversial Points in Aircraft Design," by F. T. Hill, before I.Ae.E.**
May 11	**Lecture, "Experimental Flying," by Maj. M. E. A. Wright, before I.Ae.E.**
June 25–30	**International Air Congress, London**
June 30	**R.A.F. Aerial Pageant**
July	**Air Race for King's Cup**
July 20	**Gothenburg Exhibition**
Aug. 6	**Aerial Derby**
Aug. 6–27	**French Gliding Competition, near Cherbourg**
Aug. 8–12	**F.I.A. Conference, Gothenburg.**
Sept. 23	**Gordon Bennett Balloon Race, Belgium**
Sept. 28	**Schneider Cup Seaplane Race at Cowes**
Dec. 1	**Entries close for French Aero Engine Competition**

EDITORIAL COMMENT.

ELSEWHERE in this issue of FLIGHT we publish extracts from the report of the Civil Air Transport Committee under the chairmanship of Sir Herbert Hambling, appointed by the new Secretary of State for Air, Sir Samuel Hoare, "to consider the present working of the scheme of cross-Channel subsidies, and to advise on the best method of subsidising air transport in future." That the scheme will cause considerable debate when it comes before Parliament may be accepted. As outlined in the report it is somewhat vague, and its future success will depend to a very great extent upon the ultimate form given to the details. As far as the present report goes, the idea is, briefly, that a powerful business company should be formed with a capital of £1,000,000, out of which half should be subscribed at first. The Government should give a subsidy of another million, spread over a period of ten years, and after the company had paid a cumulative dividend of 10 per cent. per annum to the ordinary shareholders any remaining profits should be divided equally between the shareholders and the Government until such time as the latter shall have received in dividends an amount equal to the subsidy (£1,000,000), when the company should be entitled to the whole of the profits.

The C.A.T. Subsidies Report

Whatever one may think of the scheme outlined, Sir Samuel Hoare is certainly to be congratulated upon his energetic attack, without loss of time, upon the vital problem of civil air transport. His committee was composed mainly of business men, and the conclusions reached by the committee were only arrived at after hearing the views of representatives of various sections of the business community, as well as of those directly connected with aviation. Sir Herbert Hambling is deputy-chairman of Parr's Bank, and Mr. Oliver Hoare, brother of the Secretary of State for Air, is manager of Cox's Bank, while Sir Joseph Broodbank was until recently an official of the Port of London Authority. Mr. Bertram, the Secretary of the Committee, is also Secretary of the C.A.A.B., and has had very extensive experience. It will thus be seen that the committee may be

assumed to be entirely unbiassed in the matter of aviation, and that it would regard the problems from a business point of view. This is all to the good, and the sooner we get the business men of the country interested, and obtain their views and advice, the better for the future of civil aviation.

So far as it goes, therefore, we welcome the report of the committee. Under the scheme suggested the Government would have but a minimum of control—only such as is afforded by the presence on the board of directors of one or two representatives of the Government—while the scheme has been drafted with the idea that it was essential that the company itself should primarily risk its own resources.

It cannot be denied that in the past the companies have lived mainly on the Government subsidies. This is casting no reflection on the firms, who have been doing valuable pioneer work in keeping the lines working and accumulating a wealth of useful data which, we hope, will be made full use of in forming the new company, assuming for the moment that such a company is formed. So long as there was no fixed Government policy the operating companies could not possibly sink the required amount of capital in their undertakings, and in our view the chief merit of the suggested scheme lies in the formation of a definite policy, a guarantee covering a period of 10 years. The details of the scheme will play a very important part, but, at any rate, it appears that we should be starting on a good foundation. It may be assumed that the distribution of the subsidy would not be in the form of £100,000 per annum, but rather would be more during the early years and less towards the end of the 10-year period. If the right man can be found to direct the new organisation a great step will have been made, but it is absolutely essential that he should be an experienced and influential business man, and, moreover, that he should be able to give almost his whole time to the new company. The problems will be so numerous and so great that no part-time arrangement with any man, however clever, could do justice to either the shareholders or the Government.

As to the principles involved: personally we have always been against subsidies, and we are even more strongly opposed to monopolies. But it is inevitable that any fair-minded person who examines the situation carefully and soberly must arrive at the same conclusion as that reached by the committee, that here is an instance where a subsidy is unavoidable and justifiable. As regards monopoly, in the past it has been proved to the hilt that competition between British companies was not competition. All the companies lived upon their subsidies, and what actually happened was that the Air Ministry was virtually competing against itself, with nobody benefiting and no visible approach to the day of self-supporting civil aviation. Therefore the suggestion that in the future—for the next ten years, at any rate—civil air transport operation should be in the hands of one powerful company, of a commercial constitution and merely occupying a privileged position, may be accepted as being thoroughly sound, provided certain safeguards are insisted upon.

For instance, after the excellent, though commercially unsuccessful, work done by the present companies, they must be given an opportunity of disposing of their valuable data at a fair remuneration in some form or other. If they desire they should be admitted as shareholders, although it is not suggested that the new company should be merely an amalgamation of the present ones. The question of the "goodwill" of the companies also arises in this connection, and would have to be considered.

Then there are the broader principles involved. For instance, if the suggested company comes into being, and is operating a certain route, unsubsidised firms should be afforded the use of the ground organisation, such as wireless, etc., assuming that such arrangements remain in Government hands and are not taken over by the new company. In this connection we think they *should* remain Government services. It would be unthinkable if lighthouses, buoys, charts, etc., were made the sole property of a commercial shipping company, and much the same position would arise in the case of air transport.

There are certainly a vast number of problems to be discussed before the scheme can be finally launched, but, fortunately, the present arrangements do not expire until 1924, and provided the present operational firms desire to carry on, nothing can be done until then. Thus there is more than a year in which to work out the details, and even, possibly, entirely modify the scheme. In the meantime, we have a very excellent basis on which to start discussions, and doubtless a scheme, even if somewhat differing from the one suggested, will be evolved during the present year.

* * *

The Schneider Cup Race

Under the notes of the Royal Aero Club will be found the announcement that the date for the race for the Schneider Cup, to be flown at Cowes, is September 28, 1923. We had hoped that it might be possible to arrange for the course to be a triangular one, laid over the Channel, with two turning-points in England and one in France. Apparently this has not been found feasible, and the choice of Cowes, in the circumstances, is, we think, a good one. The objection might be raised that in case of misty weather there might be some danger of the machines colliding with surface vessels. The danger of their colliding with one another would be present in any locality. While there is something to be said for that contention, it may be assumed that in case of misty weather the competition would be postponed.

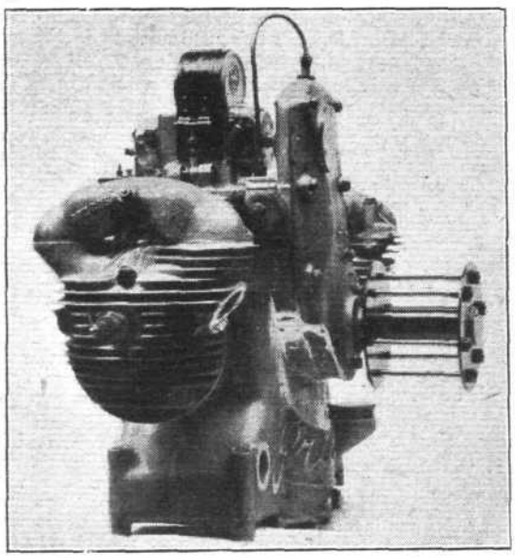
Mr. "Sammy" Saunders has, with his usual good sportsmanship, offered the use of his large sheds for the accommodation of all the machines. It will still be remembered how, in 1919, he practically rebuilt one of the French machines, and we are quite certain that Mr. Saunders will be equally willing to help should the necessity arise again this year. The scene for the competition is conveniently situated, with housing and repair facilities close at hand, both at Cowes, Calshot and Hamble.

The turning-points will be at Cowes, Calshot and Southsea, and the machines should, therefore, be in sight both from the mainland and from the Isle of Wight throughout the race. In yacht racing one of the great difficulties is to enable watchers on shore to follow the race. In that case the "outsider does *not* see most of the game," many of the finer points being lost to him from his station ashore. In the case of a seaplane race conditions are slightly better, as the machines are more clearly visible, while they will not all start together, and the main pleasure will therefore be the timing of the various competitors as they round the turning-points. We sincerely trust that the weather may be propitious.

THE BRISTOL "CHERUB" FLAT TWIN AERO ENGINE

18 H.P. at 2,500 R.P.M.

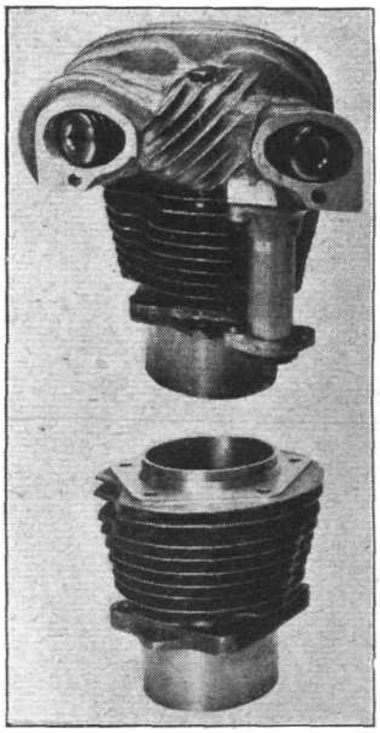
FOR several months past, in the columns of FLIGHT, we have repeatedly called attention to the possibilities of the lightly-loaded machine with an engine of low power, lamenting the absence of a British engine suitable for the purpose. The position has been a form of vicious circle. It was little use designing a machine of this type so long as one could not get an engine for it, and, on the other hand, while no machines were being built engine-makers were naturally loth to spend money on the evolution of a small engine, not knowing exactly what features it should possess, how high—or perhaps one should say rather how low—the power required was likely to be, and so forth. Now, however, an excellent start has been made by the production of a small sturdy engine, of exactly the size required, and so designed as to require a minimum of attention.



THE BRISTOL "CHERUB": Side view.

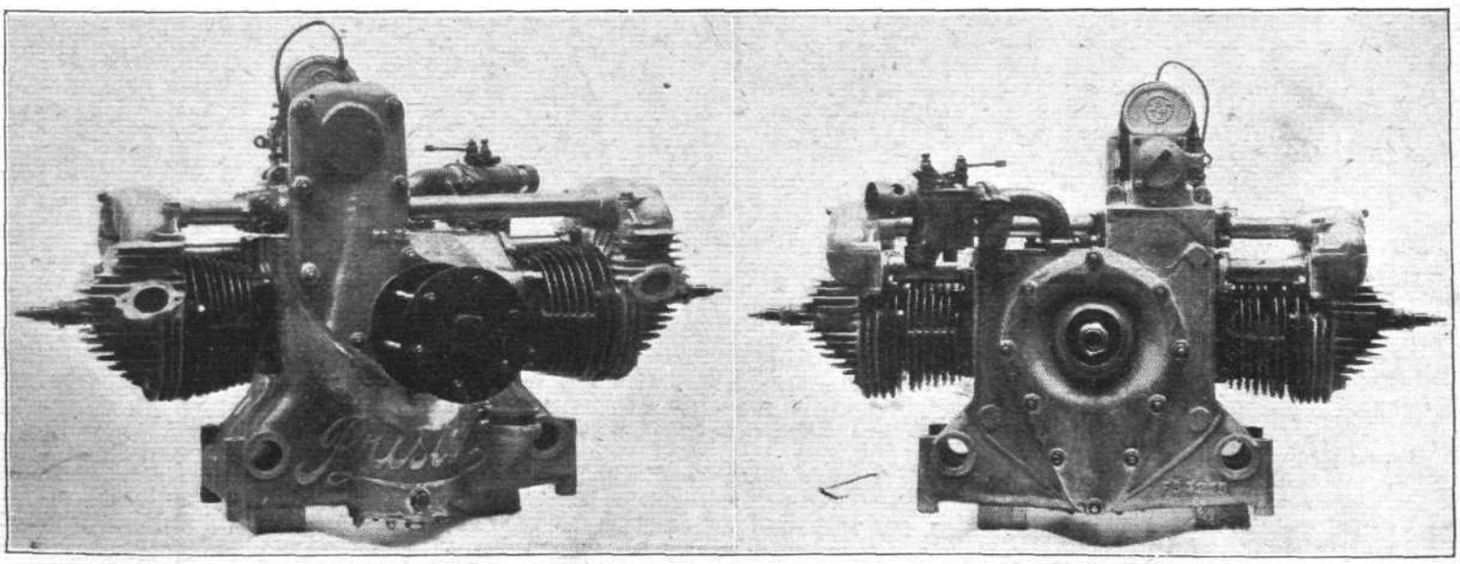
With their usual foresight, the "Bristol" Aeroplane Co., Ltd., of Filton, Bristol, have been watching during the last few months the growing interest in machines more or less of the glider type, but fitted with small engines, and their aero engine department, under the able guidance of Mr. Roy Fedden, has been developing and perfecting a small flat-twin air-cooled engine of 1,070 c.c. capacity. This work was started more than a year ago, and a stage has now been reached when the firm are convinced that they have produced an engine that is up to the very high standard of efficiency and reliability demanded from all "Bristol" products.

The new "Bristol" engine, known as the "Cherub," has been subjected to exhaustive experiments and tests on the Froude test bench under conditions exactly similar to those demanded by the Air Ministry for large aero engines, and the experience gained with the famous Bristol "Jupiters" and "Lucifers" (the former of which recently established a new world's height record in France, where the engines are being built under licence by the Gnome and le Rhône Co.) has enabled the firm to produce this smaller sister, which, it may be taken for granted, will live up to the reputation established by the larger types. During the testing-out of the experimental engine, several 10 hours' non-stop runs have been made on the Froude dynamometer, and there is reason to believe that the "Cherub" will prove extremely reliable in service.



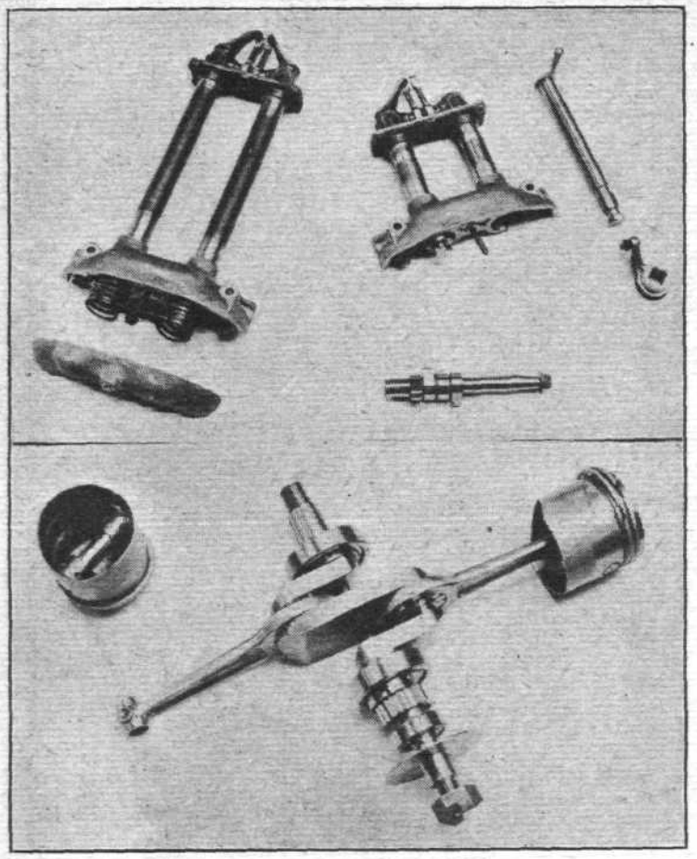
A cylinder of the Bristol "Cherub" with detachable head removed and in place.

The Bristol "Cherub" is being manufactured in two slightly different types, so as to make allowance for the preferences of individual aeroplane designers. In one type a two-to-one reduction gear is enclosed in the crank-case. In



THE BRISTOL "CHERUB": Front and rear views.

the other the driving boss is run at crankshaft speed, to be used in conjunction with a chain-driven propeller. This is, we think, a very wise precaution on the part of the designers of the "Cherub," as it is at any rate conceivable that, especially for experimental purposes, gear ratios other than two-to-one may be required. For instance, a small machine



THE BRISTOL "CHERUB": Above details of camshaft, rocking-shafts, etc., and below the crankshaft and connecting rod assembly.

designed with the object of getting a fairly high top speed, *i.e.*, with a reasonably heavy wing loading, might employ the two-to-one internal gearing and still get quite good propeller efficiency On the other hand, a different type of machine might be intended for very low landing speed, light wing loading, and good climb, but not with a very high maximum speed—say, 45 m.p.h. or so. In that case, the running of the propeller at 1,250 r.p.m., with a forward speed of only 45 m.p.h., would scarcely result in very good propeller efficiency, and it might be advisable to choose a 3-to-1. or even lower gearing. This could be very easily and cheaply done by fitting the sprocket type of engine, and then experiment with different reduction ratios. Thus a large-diameter, low-pitch propeller could be used, giving very good propeller efficiency.

The accompanying illustrations show clearly the general design of the Bristol "Cherub." Two opposed cylinders are attached to a box-shaped crank-case of aluminium. The cylinders, which have a bore and stroke of 85 mm. and 94 mm. respectively, have detachable alluminium alloy heads, held on to the cylinder barrel by five bolts. The valves are inclined in the head, and are operated by a somewhat unusual valve gear.

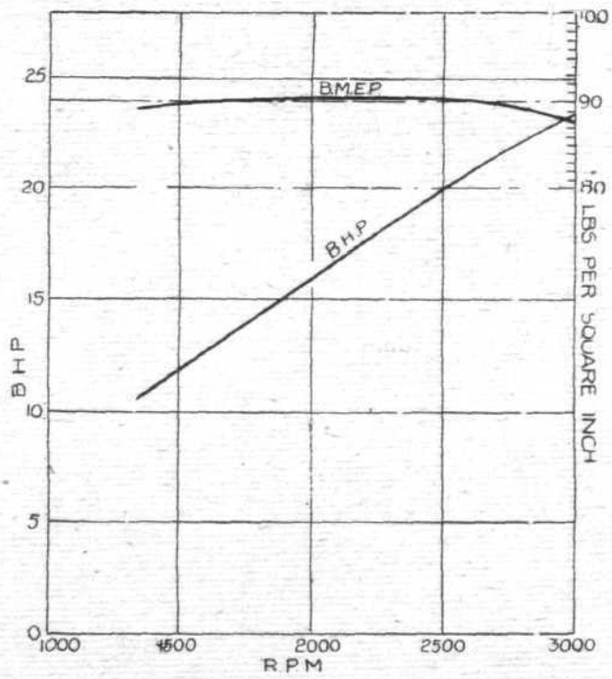
A single camshaft with four cams integral with the shaft lies inside the crankcase, and is driven by very robust gearing from the crankshaft. The cams operate fingers, which in turn operate cranks, on the inner ends of shafts running parallel to the cylinders. These shafts are not push-rods, as they are not displaced lengthwise, but oscillate or rock under the action of the cams. At their upper, or more correctly speaking outer, ends these rocking shafts carry other cranks, bearing on the ends of the valve stems, or rather on the washers which cap the valve springs. The rocking shafts are enclosed in tubes, and the whole mechanism is enclosed and automatically lubricated. Thus comparatively silent running is obtained, while the arrangement is such that the clearance between rocking shafts and valves does not alter with expansion of the cylinders. The only occasion for adjustment should therefore be to take up any slight wear that may develop after prolonged running. This should be so small that, for all practical purposes, the valve mechanism should very rarely need attention.

The crankshaft, which is, of course, of the two-throw 180° type, is of ample dimensions, and is very stiff and robust. It is carried in three ball bearings, with a thrust bearing in front. The connecting rods are threaded on to the crankshaft, and run on case-hardened crankpins with $\frac{7}{16}$-in. rollers. The big ends of the connecting rods have case-hardened bushes inserted. From the photograph it will be seen that the whole crankshaft and connecting rod assembly are of very ample proportions, and special attention has been given to the connecting rod roller bearing assembly, so that very long life can be guaranteed under continuous working conditions.

The crank-case is a one-piece aluminium casting, having at the rear end a very large opening which enables the connecting rod assembly to be inserted complete. An induction duct is formed inside the top portion of the crank-case, and extends in the form of an inlet pipe at each end to the inlet valves in the cylinder head. A short bent induction pipe communicates with the duct, and carries a Zenith carburettor, drawing air heated by the exhaust pipe. Ignition is by a B.T.H. twin-cylinder magneto, mounted on a platform on top of the crank-case, near the right-hand side. Single sparking plugs are fitted centrally in the cylinder heads.

Lubrication is automatic throughout. Oil is positively delivered to the timing gears, camshaft, rocker mechanism, etc., and pressure feed is directed on to the connecting rod assembly, from which the cylinders are lubricated by splash. A gallon of oil is carried in the sump in the lower portion of the crank-case, which floods the plunger pump. An oil filler and filter is arranged on the front of the crank-case, and is visible in the front view of the engine.

The main details of the Bristol "Cherub" are as follows:—Two-cylinder, horizontally opposed; bore, 85 mm.; stroke,



Power curve of the Bristol "Cherub."

94 mm.; R.A.C. rating, 8.95 b.h.p.; rated h.p., 18 at 2,500 r.p.m.; weight of engine complete, 85 lbs.; petrol consumption per hour, 12 pints; oil consumption per hour, ½ pint.

It will be seen that the "Cherub" is not particularly light, and there is no doubt that, had they so wished, the designers could have reduced the weight considerably. They have chosen, however, to produce a robust engine whose reliability could be guaranteed, rather than go for extremely light weight. The accompanying power curve shows that at 2,500 r.p.m. the engine develops 20 h.p. The makers

rate it at 18 at that speed, and the curve continues to go up, although we take it that 2,500 is the normal maximum at which the engine should be run for any length of time. The compression ratio is 4·5 to 1, and the brake mean effective pressure about 90 lbs./sq. in.

We understand that a small production batch of these engines is now being put through the shops at Filton, so that the "Cherub" should soon be available commercially. That the engine really in this case does "fill a long-felt want" cannot be doubted. It is of sufficient power to fly a lightly-loaded machine at quite a good turn of speed. A rough estimate indicates that it should be possible to build a single-seater machine which would have a maximum speed of about 60 m.p.h., with the engine developing 18 h.p., and a landing speed of just over 30 m.p.h. The minimum power required should not be more than about 10 h.p., so that a good reserve should be available, both for getting off and for flying extremely cheaply at cruising speed. A smaller engine would be sufficient for just flying around in the neighbourhood of an aerodrome, but with the "Cherub" cross-country flights should be well within the limits of practical politics. In this connection, it is interesting to refer to the small Udet two-seater described in this issue of FLIGHT. That machine is fitted with a Haacke two-cylinder opposed engine of 35 h.p., so that the power expenditure per occupant is the same as would be that of a single-seater with the "Cherub" engine. With two up the Udet has a speed of 95 m.p.h. Its wing loading is, however, rather high, about 9·5 lbs./sq. ft., and the landing speed is probably greater than we should choose for a machine of this type. But even with a lower wing loading the top speed should be reasonably good, while the landing speed and get-off should be such as to enable a machine to be landed in and taken out of almost any reasonably sized field.

At the moment of writing we have no information relating to the price at which it is intended to market the Bristol "Cherub." We have heard the figure £75 mentioned, but do not know if this represents the actual price. It appears probable that it will be a matter of some difficulty finally to decide upon a price until the first batch of engines has been completed, when data of production costs should be available. Readers are advised to apply to the Bristol Aeroplane Co., Ltd., Filton, Bristol, for any further particulars desired.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

RACING COMMITTEE

A MEETING of the Racing Committee was held on Wednesday, 21st February, 1923, when there were present:—Major-General Sir W. S. Brancker, K.C.B., in the Chair, Commander James Bird, Lieut-Col. W. A. Bristow, Lieut.-Col. M. O. Darby, Lieut.-Col. F. K. McClean, A.F.C., Mr. T. O. M. Sopwith, and the Secretary.

Schneider International Seaplane Race.—The Committee had before them proposals to hold the Race at Eastbourne, Brighton, Weymouth, Cowes and Torquay.

After hearing the report from the Special Committee on the facilities available at each of these places, it was unanimously decided to select Cowes, and to hold the Race on Friday, the 28th September, 1923.

Mr. S. E. Saunders of Cowes has kindly placed at the disposal of the Royal Aero Club his Solent Works, which provide ample accommodation for housing all the competing machines.

The course, although not finally settled, will include turning points at Cowes, Calshot and Southsea.

COMMITTEE MEETING

A MEETING of The Committee was held on Wednesday, 14th February, 1923, when there were present:—Lieut.-Col. F. K. McClean, A.F.C., in the Chair, Wing-Commander W. D. Beatty, C.B.E., Major-General Sir W. S. Brancker, K.C.B., Mr. Ernest C. Bucknall, Lieut.-Col. M. O. Darby, Lieut.-Col. A. Ogilvie, Lieut.-Col. M. O'Gorman, C.B., Rear-Admiral Sir Godfrey M. Paine, K.C.B., M.V.O., Mr. T. O. M. Sopwith, and the Secretary.

Election of Member.—The following New Member was elected:—

Robert Brenard.

Special Conference of the F.A.I., Paris, 20th March, 1923.—Lieut.-Col. M. O'Gorman was appointed to represent the Club at the F.A.I. Conference, Paris, 20th March, 1923.

Customs Carnet for Touring Aircraft.—Correspondence was submitted from the F.A.I. notifying the Royal Aero Club that the French Customs Authorities were in favour of the introduction of the Customs Carnet for Touring Aircraft.

It was decided that the Royal Aero Club, as representing the F.A.I. in Great Britain, should give the necessary guarantees on behalf of British Touring Aircraft.

Britannia Challenge Trophy.—The awarding of the Britannia Challenge Trophy presented to the Club by Capt. H. Barber for the most meritorious performances in the air during the years 1919-20-22 respectively, was considered

It was decided to make the following awards:—

1919. To the late Sir John Alcock, K.B.E., for his cross-Atlantic Flight (St. John's, Newfoundland-Clifden, Co. Galway), 14-15 June, 1919. Vickers-Vimy Biplane, 2-350 h.p. Rolls-Royce Eagle VIII Engines. 1890 miles. 16 hrs. 12 mins.

1920. To Bert Hinkler for his flight from Croydon to Turin, 31st May, 1920. Avro Baby Biplane, 35 h.p. Green Engine. 650 miles. 9 hrs. 35 mins.

1922. To F. P. Raynham for his Glide at Firle Beacon, Sussex, 17th October, 1922. Duration 1 hr. 53 mins. 2 secs.

Gordon Bennett Balloon Race.—The Secretary reported the entry of Mr. Ernest Allen for the Gordon Bennett Balloon Race to be held on 23rd September, 1923, in Belgium.

Certificates of Performance.—The following Certificates of Performance were granted to the Gloucestershire Aircraft Co., Ltd.:—

THE ROYAL AERO CLUB CERTIFICATE OF PERFORMANCE

(*Under the Competition Rules of the Royal Aero Club.*)

Type: Gloucestershire Mars I.
Constructor: Gloucestershire Aircraft Co., Ltd., Cheltenham.
Motor: Napier "Lion." *Pilot:* J. H. James.
Place: Villesauvage, near Etampes.
Date: 4th October, 1922.

Greatest Speed over a Straight Line Course of One Kilometre

Performance.—341.423 kilometres per hour — 212.15 miles per hour.

(Being the mean speed of two double flights in accordance with the Regulations of the Fédération Aéronautique Internationale, Class C. No. 4B.)

J. T. C. MOORE-BRABAZON, Chairman.
HAROLD E. PERRIN, Secretary.

THE ROYAL AERO CLUB CERTIFICATE OF PERFORMANCE

(*Under the Competition Rules of the Royal Aero Club.*)

Type: Gloucestershire Mars I.
Constructor: Gloucestershire Aircraft Co., Ltd., Cheltenham.
Motor: Napier "Lion." *Pilot:* H. A. De H. Haig.
Place: Martlesham Heath, Suffolk.
Date: 23rd November, 1922.

Performance Climb—

Climb.	Mins.	Secs.	Rate of Climb in Ft./Min.
5,000 feet ..	1	51	2,390
10,000 ,, ..	4	15	1,855
15,000 ,, ..	7	25	1,325
19,500 ,, ..	11	34	845

February, 14th, 1923.

J. T. C. MOORE-BRABAZON, Chairman
HAROLD E. PERRIN, Secretary.

Offices: THE ROYAL AERO CLUB,
3, CLIFFORD STREET, LONDON, W. 1.
H. E. PERRIN Secretary.

CIVIL AIR TRANSPORT SUBSIDIES REPORT

Important Recommendations for Developing Civil Aviation

IMPORTANT recommendations as to the best method of subsidising air transport in future are contained in a White Paper (Cmd. No. 1811) issued on February 23 by Lieut.-Col. Sir Samuel Hoare, Bt., Secretary of State for Air. The proposals are made by the Civil Air Transport Subsidies Committee, consisting of Sir Herbert Hambling, Chairman; Sir Joseph Broodbank; and Mr. Oliver T. G. Hoare, with Mr. F. G. L. Bertram as Secretary, and Mr. David H. Allan as Financial Secretary, which was appointed by the Secretary of State on January 2 "to consider the present working of the scheme of cross-Channel subsidies and to advise on the best method of subsidising air transport in future."

The recommendations of the Committee are far reaching. It proposes that on the termination of the present agreements with the British companies operating services on cross-Channel routes, a new company, with a capital of £1,000,000 (of which at first £500,000 should be subscribed), should be established to operate air transport services which would be guaranteed subsidies of not less than £1,000,000 over a period of ten years, control to be exercised by the Government through one or two nominated directors.

The Committee states that it has made this proposal because it cannot satisfy itself that "any comparatively small operating company can be in such a position as to expend the necessary capital from its own resources on experiment, research and development," and it also expresses the opinion, for the same reason, that it is "not prepared to recommend that the Government should grant subsidies to any company which is merely an amalgamation of the existing companies."

The Committee held fifteen meetings, and took evidence from representatives of the Air Ministry, operating companies, aircraft constructing companies and large commercial organisations, and from others. The report is divided into two parts; in the first the Committee reviews the past and present schemes of subsidy, and in the second it presents its proposals for the future. In this regard it is stated that the question of airship services or the question of an aeroplane service to India have not been dealt with, as both these subjects have already received independent consideration.

In presenting their proposals for the future the Committee states that it has been thought necessary to approach the problem afresh from the beginning.

The Report states "We have assured ourselves that there is a very real desire in their own interests on the part of the commercial world, both manufacturers and merchants, to see efficient air transport services in operation between this country and the Continent, even at the cost of considerable subsidies from the Government, notwithstanding their strong views on the need for national economy. We have, for instance, had brought to our notice the desire of the Manchester Chamber of Commerce for quicker methods of transporting their samples, mails and light goods abroad, which implies the maintenance of the Manchester–London service and the extension in the length of the services operated."

The importance of operational research is emphasised, and the Committee express the view that a large sum of money must be expended on this work during the next few years. They have also been impressed by the statement that the London–Paris and London–Brussels services are too short to be more than commercially experimental, and that a company can only be self-supporting by the development of new and longer routes. This again involves, they say, much financial expenditure.

The Committee is satisfied "that no effective spending of Government subsidies by the companies can be obtained unless the companies themselves are concerned in the risking and expenditure of their own resources. It is no reflection on the existing companies to say that neither they nor any other company can be expected to find or risk the necessary amounts unless subsidies are provided and their position in every respect secured for a longer period than three years."

They go on to point out that the amount of the subsidies and compensations paid by the Air Ministry under the temporary and permanent schemes was approximately double the passenger and freight revenue, so that the burden of the financial risk was mainly on the Government, which was, therefore, in effect, competing with itself. "There was not sufficient demand for air traffic," they consider, "to offer the conditions essential to real competition, and the result of the permanent scheme was, therefore, to increase the number of British aeroplanes on the London–Paris route, with consequently increased expenditure on flying costs, insurance and depreciation, and to reduce the number of passengers per machine while the unnecessary cost of separate organisation and independent management was maintained. The benefit of competition under these schemes was therefore illusory, and until civil aerial transport has become more nearly self-supporting we do not think competition can be relied on, unless at an unnecessary cost, to stimulate its development. So far as efficiency of service is concerned adequate incentive should be provided by the direct competition of foreign countries with large Government resources behind them. We do not think, therefore, that in any scheme of subsidies it is necessary at present to ensure competition."

The proposals outlined are as follows:—

Subsidies could be given:—(*a*) To the existing or other independent operating companies; (*b*) to an amalgamation of the existing companies; or (*c*) to a new commercial organisation established for the purpose.

We have examined each of these proposals in turn, and have decided against recommending the adoption of the first method because we cannot satisfy ourselves that any comparatively small operating company can be in such a position as to expend the necessary capital from its own resources on experiment, research and development.

We feel, however, in view of the part that the three existing subsidised companies have taken during these difficult years, that their interests should not be overlooked in any proposals for the period subsequent to the termination of the present arrangements on March 31, 1924. For the same reason we are not prepared to recommend that the Government should grant subsidies to any company which is merely an amalgamation of the existing companies. We have, therefore, been forced to recommend the creation of a new organisation as the solution of a difficult problem that is most likely to attain the end we have in view.

In the first place, we desire to make it clear that we do not recommend the creation of a corporation or company administered under Government control, but of a commercial organisation run entirely on business lines with a privileged position with regard to air transport subsidies, on terms and conditions to be defined later.

We consider that it would be impossible to bring such an organisation into existence on the security of subsidies granted only for the short period of three or five years, and that a bolder policy of guaranteeing a total subsidy of a stated amount, spread over a period of ten years, should be faced, and, in our deliberate opinion, is the only sound policy that is likely to meet with success.

An essential condition, however, to such a proposal is that the company should have large resources of its own, so that in the expenditure of capital on operational experiment and on the development of new and extended routes, the company is primarily risking its own resources.

As an indication of the main lines of our proposals, we suggest that::—

(*a*) The Company should have a capital of £1,000,000 (of which at first £500,000 should be subscribed), with the right to the Government of nominating one or two directors, and the whole of the subscribed capital should have been guaranteed before the Government commenced to subsidise the company.

(*b*) The profits of the company should be divided as follows:—(1) In payment of a cumulative dividend of 10 per cent. per annum on the ordinary shares of the company. (2) After the foregoing dividend has been satisfied, the balance of profits in any year to be divided equally between the shareholders and the Government. (3) When the Government shall have received in dividends £1,000,000 (being the proposed amount of subsidy without interest) the Government interest in the company ceases and the whole profits of the company shall belong to the shareholders.

(*c*) The Government should guarantee a subsidy (spread over the period of ten years, but not in equal annual instalments) of such an amount as will enable a financial group to raise the share capital, and in our opinion such subsidy will not be less than £1,000,000; conditions must be attached to the payment of the subsidy requiring the company to perform services in connection with the operation and development of commercial air transport.

(*d*) The Government should not exercise any direct control

over the activities of the company, other than by the appointment of directors, except for the purpose of such checking as may be necessary to determine the amount of subsidy payable, and except for such control as may from time to time be exercised by the Government through the Civil Aviation Department over all civil flying in the country.

(*e*) Restrictions as to the routes operated, the types of machines, the number of daily services, the minimum allowance for point to point flights, etc., should be unnecessary, as it would be in the interests of the directors to manage the company to the best commercial advantage at the minimum cost with the best types of machines.

(*f*) There should be an agreement between the Government and the company that in the event of war or of the imminence of hostilities the Government would have the right to take over all aircraft engines and plant on conditions to be laid down.

(*g*) The agreement to be terminated if the company goes into liquidation, and the Government to have the right of cancellation under stated conditions.

If our recommendations are approved in principle, and if a financial group propose the establishment of such a company we think that the services and facilities now provided free by the Government to the present companies should be continued to the suggested new company, and possibly further extended.

The British Industries Fair

THE aircraft industry was not directly represented to any appreciable extent at the British Industries Fair at the White City—which, by the way, closes on Friday. In fact, apart from model aeroplane firms, our tour of inspection brought to light only some three or four exhibitors connected with or handling aircraft material. These were: Cellon (Richmond), Ltd. ("Cerric" bronzing mediums, lacquers, enamels, etc.); Ross, Ltd, London (aeronautical instruments); J. H. Dallmeyer, Ltd., and W. Vinter (both showing aero cameras). The "Cerric" goods manufactured by Cellon, Ltd., are, practically speaking, a development of the famous Cellon aeroplane dopes, and although they apply to aircraft work only in certain cases, we hope to refer to the "Cerric" products in detail on another occasion. Models were represented by Ralph Bullock, of Forest Hall, Northumberland; Burnett, Ltd., 53A, Aldersgate Street, E.C. 1; Lines Bros., Ltd., 761, Old Kent Road, S.E.; and F. J. Mee, 137A, Greenwich Road, S.E. 10. We wish to make special reference to the "Feather aeroplanes" of Ralph Bullock, which, as the name implies, are made of natural feathers—that is, the wings each consist of a single feather, and the tail surfaces are also made from suitable parts of a feather. As a result an extremely light and strong machine is produced, which, moreover, flies exceedingly well. Several types are made—monoplane and biplane, hand-launched and R.O.G.; and they vary in size from a few inches in span upwards.

Sadi Sees the President

ON February 26 Sadi Lecointe was received in audience by the President of the French Republic, an honour rarely bestowed upon aviators. The President chatted with Lecointe for a considerable time, and complimented him on having regained for France the honour of holding the world's speed record. The President concluded by saying, "We all admire the courage of the aviators, and yours in particular. You are a great and good Frenchman."

French Civil Aircraft.

ACCORDING to *L'Auto* the French civil air fleet is at present composed as follows: 271 machines in use on approved air lines, 178 machines in use on other lines, 198 machines in use at flying schools and 29 private machines used for touring, etc. The total is 676 civilian aeroplanes.

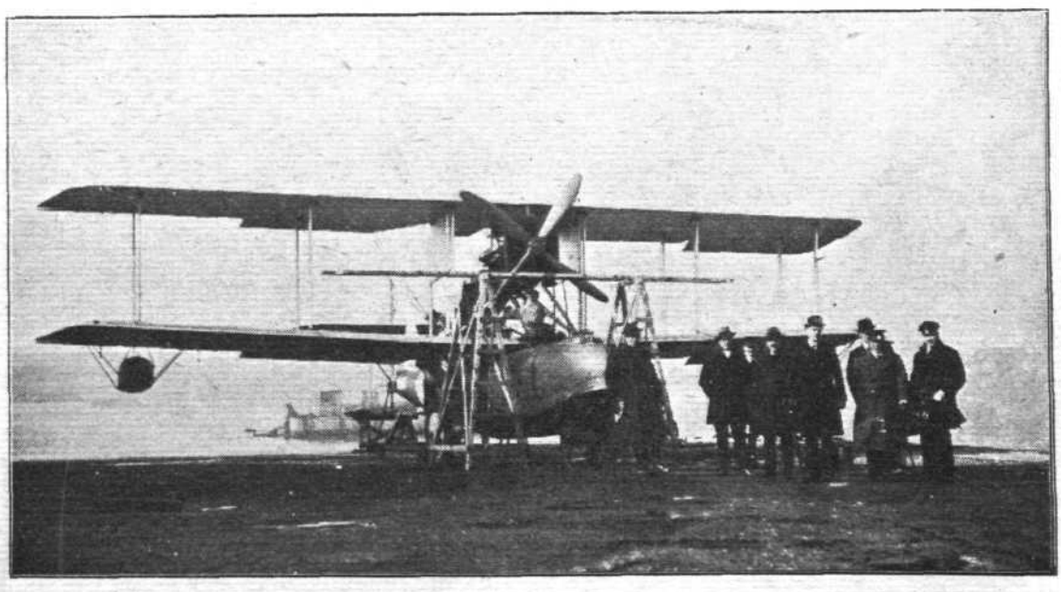
Entries for Schneider Cup Race

ALREADY six machines have been entered by France for the Schneider seaplane race to be held at Cowes on September 28. Two of these have been entered by Société Industrielle de Caudebec-en-Caux, two by Société Aéronautique Blanchard and two by Chantiers Aero-Maritime de la Seine. The managing director of the latter firm is Mr. Lawrence Santoni, who will be remembered as a director in the British Deperdussin Co. with the late Comdr. Porte before the War, and later as a director of the Italian Savoia company. As each nation is only entitled to send three representatives, presumably eliminating trials will have to be flown.

It is also reported that the United States Navy is entering three machines, so that, with the possibility of three Italian machines being entered, the Schneider Race this year should be worth watching.

Aluminium Facts and Figures

UNDER the above title a very handy and useful little book has been published by the British Aluminium Co., Ltd., of 109, Queen Victoria Street, E.C. In addition to numerous tables giving sizes, weights and other necessary particulars of aluminium and aluminium alloy, in its various forms (ingots, rod, sheet, wire, etc., etc.), this work contains some very useful hints on the working of aluminium, such as casting, machining and sheet-metal work. The book is in convenient pocket size, and is published at 5s.



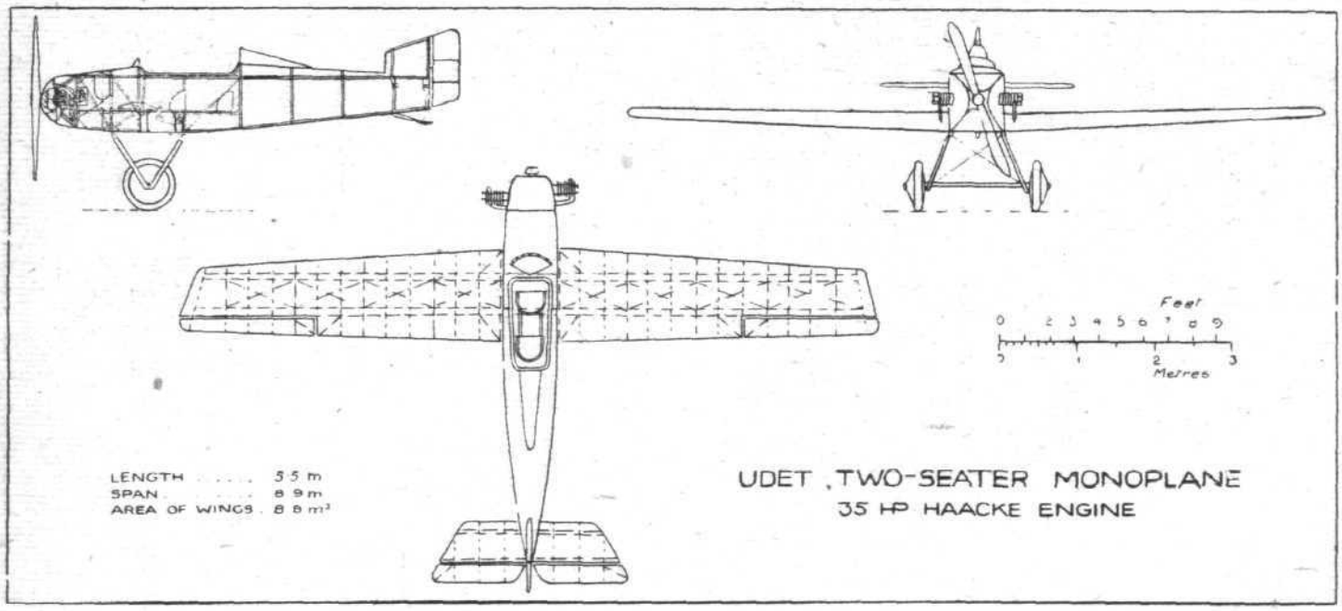
A VISIT TO SOUTHAMPTON: Our photograph shows, from left to right, standing in front of a Supermarine "Seagull," with Napier "Lion" engine, Sir Warden Chilcott, M.P., Commander James Bird, General Bagnall-Wild, Director of Research, the Duke of Sutherland, Under-Secretary of State for Air, Air Vice-Marshal Vyvyan, and Mr. Hubert Scott-Paine.

THE UDET SPORTING TWO-SEATER

35 H.P. Haacke Engine

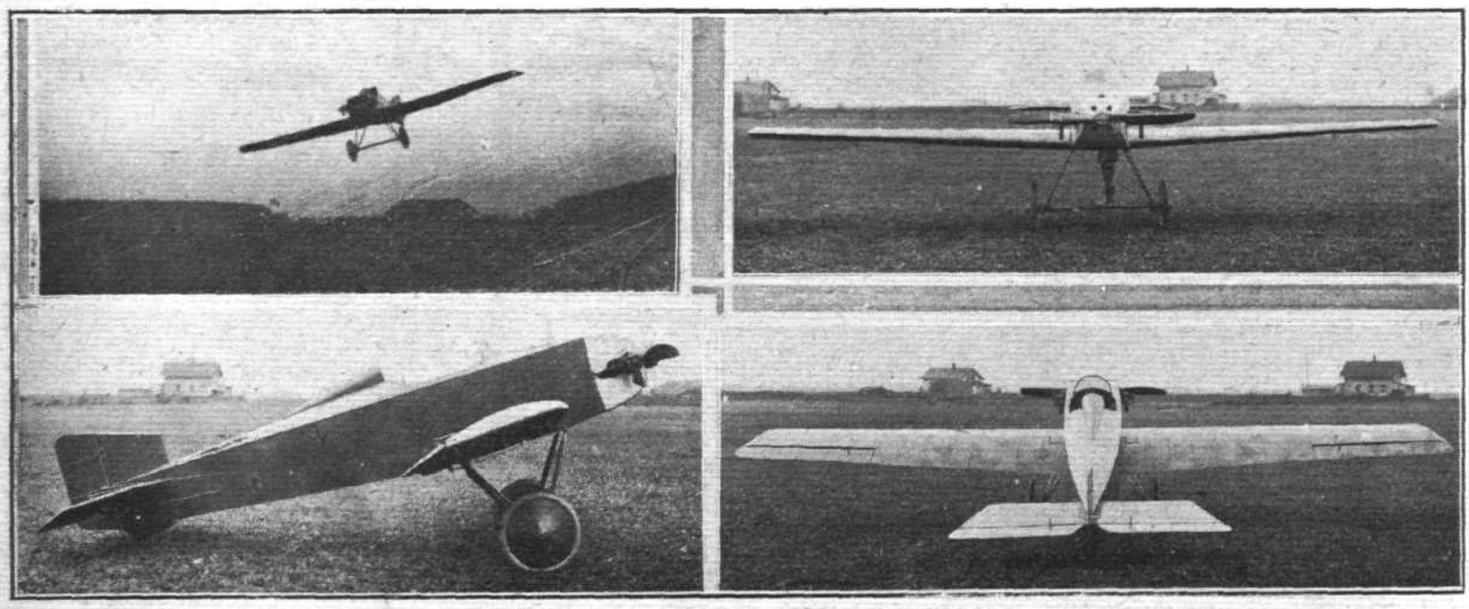
IN our issue of July 13, 1922, we published illustrations and a description of the Udet sporting single-seater monoplane built by the Udet Aircraft Works of Munich. Since then, that firm has been experimenting with a development of the original experimental machine, and the result is that a two-seater, similar in general appearance to the first machine, has been developed to the point where the designers feel that they can standardise it for quantity production. This is now being done, and as the machine provides a very good example of what can be done with an engine of low power, we have thought that a brief reference to it may be of interest to readers of FLIGHT, more especially in view of the recent production by the Bristol Aeroplane Co. of the 18 h.p. "Cherub" engine described and illustrated in this issue.

From the accompanying scale drawings it will be seen that the Udet monoplane, in spite of the fact that it has a cantilever wing, is of high aspect ratio. This, coupled with the clean lines of the machine, is no doubt mainly responsible for the general efficiency, and although personally we are of the opinion that the wing loading is too high for a machine of this type, there is no doubt that the top speed is uncommonly good for such a low-power engine. The makers state that the maximum speed is about 150–155 km./hr. (93–96 m.p.h.). As the wing loading is about 9·5 lbs./sq. ft., the landing speed is probably high. No figures are supplied by the makers, but a rough estimate indicates that the minimum speed cannot be much less than 50 m.p.h. That in itself, is not a high figure for the ordinary aeroplane, but as a machine of this type is probably not intended to be used by experienced pilots only, a reduction in the landing speed of 10 m.p.h. or so would, we think, have done no harm. However, this is mainly a question of personal opinion, and if a good top speed is desired, a fairly high landing speed is unavoidable.



THE UDET TWO-SEATER : General arrangement drawings, to scale.

Constructionally, the Udet two-seater is similar to the single-seater, *i.e.*, the fuselage is a flat-sided plywood-covered structure, while the wings are built up on two box spars having spruce flanges and three-ply sides. The choice of low wing position has doubtless been made mainly on account of a desire to keep the wing in one piece. With the wing placed above the fuselage this would have been difficult, as the placing of the cockpits would interfere with the attachment of the rear spar. Aerodynamically, this wing position is generally thought to be slightly inferior to the parasol



THE UDET TWO-SEATER : Three views of the machine on the ground, and one showing it in flight.

or wing-on-top-of-the-body type. There is no doubt, however, that both structurally and as regards good visibility for the pilot, the present arrangement has much to recommend it. Another advantage of the low wing is that it becomes easier, without going to a very wide wheel track, to provide against the machine turning over on to its side. In the case of the Udet it is stated that the machine can heel over until a wing tip touches, and the only result is that the wing throws it on to its undercarriage without damage to the wing itself.

The attachment of the wing to the fuselage is interesting, and is somewhat similar to that employed by Fokker in the case of some of his biplanes and triplanes, *i.e.*, the spars rest in a cut-out portion and are located by four bolts. As the longitudinal members of the fuselage rest direct on the wing spars, the four bolts do not have to support the load, as would be the case were the wing placed above, but merely to serve to locate the wing.

In order to remove the wing the fuselage is placed on two trestles. The rear undercarriage struts are detached, and the undercarriage swung forward, when the four wing bolts can be got at and the plane dropped out of its notch. For purposes of transport, the wing is placed above the fuselage on two special trestles provided for the purpose.

The two-cylinder Haacke engine is neatly mounted in the nose of the machine, and is cowled-in all but the outer portion of the cylinders. The petrol tank is placed between the pilot and the fireproof engine bulkhead, and it is stated that there is sufficient "head" to provide direct gravity feed. Incidentally, if we may offer a small criticism of the Bristol "Cherub," it would appear that a better placing of the carburettor might have been below the engine instead of on top of it. In this way gravity feed would have been facilitated. However, if found desirable, this little alteration can probably be easily made. The normal speed of the Haacke engine is 1,400 r.p.m., but the Udet will fly level with the engine throttled down to about 950 r.p.m. The machine is said to be very manœuvrable, without being too sensitive on the controls, and we understand that it has been found particularly easy to fly, pilots who have not flown since the War having tried it and found no difficulty at all in handling it. The run required for getting off is given as 45 meters (about 50 yards), and the landing run is about 40 yards, the undercarriage being rather high and affording a large angle of incidence when the tail is on the ground.

The main particulars of the Udet two-seater sporting monoplane are as follows: Length, o.a., 5·53 m. (18 ft. 2 ins.); span, 8·9 m. (29 ft. 2 ins.); height, 2·1 m. (6 ft. 10 ins.); wing area, 8·8 sq. m. (95 sq. ft.); weight empty, 230 kgs. (506 lbs.); useful load, 400 lbs.; total loaded weight, 906 lbs.; wing loading, 9·5 lbs./sq. ft.; power loading, 26 lbs./h.p.; maximum speed, 150 km. (93 miles) per hour; climb to 1,000 m. (3,300 ft.) in 8 mins.; normal range, 500 km. (310 miles).

GLIDING, SOARING AND AIR-SAILING

REFERENCE was made in these notes last week to the Poncelet glider which was tested recently over the Brussels aerodrome by the Belgian pilot Lieut. Simonet. This week we are able to publish a couple of photographs of the machine, very kindly sent to us by Mr. Cornelius van Steenderen, of Brussels. The machine, it will be seen, is of pleasing lines, and has a wing section similar to the Fokker. The wing is made in one piece, and is attached to the fuselage by four U-bolts. The ailerons have turned-up tips, much after the fashion of certain German machines in the earlier days of flying. The pilot sits in front of the wing, with his head in a cut-out portion of the leading edge as in the Hannover "Greif."

* * *

IN addition to the Poncelet glider several others are being built in Belgium at present. Among these is one by Lieut. Van Cotthem, who was formerly pilot to the King of Belgium, and who is now chief pilot to the S.A. Entreprises d'Aeronautique at Gosselies, which firm use the Central Aircraft Co.'s "Centaur 4A" machines exclusively for their school work in training military pilots. Another machine is, we understand, being built by Commdr. Jacquet, formerly C.O. of the Belgian Escadrilles de Chasse.

* * *

ALEX. MANEYROL keeps pegging away at his experiments at Vauville. As recorded last week he made an experimental flight in which he covered nearly 2 miles. On February 26 he made a flight of a little over 6 miles by flying from Vauville to Joburg. Whatever other prizes may be his as a result of this flight, it appears probable that he will be the winner of the Dewoitine prize of 5,000 francs, the last day of the competition for which was February 28.

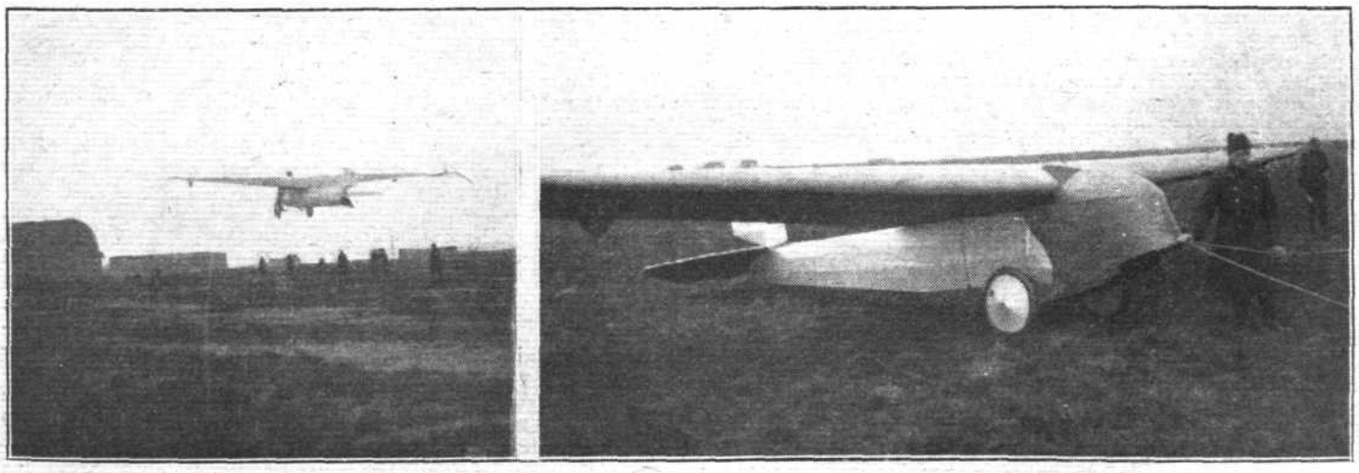
WE wish to call special attention to the illustrated description of the Bristol "Cherub" engine which appears in this issue of FLIGHT. With a normal maximum power of 18 b.h.p. this engine should be of just the right size for use in small lightly-loaded machines, more or less of the glider type. It should be possible, for instance, to design a single-seater with a total weight of 600 lbs. and a wing loading of about 5 lbs./sq. ft., to do a maximum speed of 60 m.p.h. and having a landing speed of about 35 m.p.h. Throttled down to about 45 m.p.h. such a machine should do at least 50 miles per gallon of petrol. Even at full power, with the engine using 12 pints per hour, the consumption would work out at 40 miles per gallon.

* * *

INCIDENTALLY, a term is badly wanted to describe the lightly-loaded, low-power machine, which, as it is fitted with an engine, is certainly not a glider, and which, so some superior persons might be inclined to say, is certainly not an aeroplane either. We might borrow from the automobile world the equivalent of "light car," and refer to the small machine as a "light 'plane."

* * *

WE have previously referred to the injustice done to the small, low-power aeroplane by the imposition by the Air Ministry of a minimum "airworthiness" fee of £65. If a firm is going to build a few dozen machines this original fee is not so prohibitive, but as it seems more than likely that machines to take such low-power engines may be built in ones and twos, or may even be built by amateurs, it is scarcely fair to impose this high fee. Once more, may we have a statement on the subject from the Air Ministry please.



The Belgian Poncelet Glider, in flight and on the ground.

THE U.S. NAVY AIRSHIP MOORING MAST

TOWARDS the end of last year the U.S. Navy completed the erection of an airship mooring mast—the highest mooring mast yet constructed—at Lakehurst, N.J. Some brief particulars and illustrations of this mast appeared in our American contemporary *Aviation*, and we reproduce these herewith as an indication of the latest practice in this important section of airship development.

Apart from its height, a distinctive feature of this mast is that it is the first to be constructed without the employment of wires for staying. It is composed of the following principal

THE U.S. NAVY AIRSHIP MOORING MAST : A general view of the mast erected at Lakehurst air station.

units : 1, foundation for tower, machinery and snatch block anchorages ; 2, a triangular steel tower, 165 ft. high, with three platforms, passenger lift, pipe lines for gas, fuel, oil and water, telephone and voice-tube systems ; 3, the mooring gear at the top ; and 4, the mooring gear at the bottom.

The construction of the tower, as may be seen from the illustration, is similar to that employed for certain wireless masts, the three triangulated legs at the base extending outwards at the vertices of an equilateral triangle. At the base of the tower is a building for housing four officers and twenty men, forming the landing crew ; an office elevator entrance, one main and two auxiliary winches for the lines used in bringing the ship to the mast, together with the pumps for water, fuel and oil.

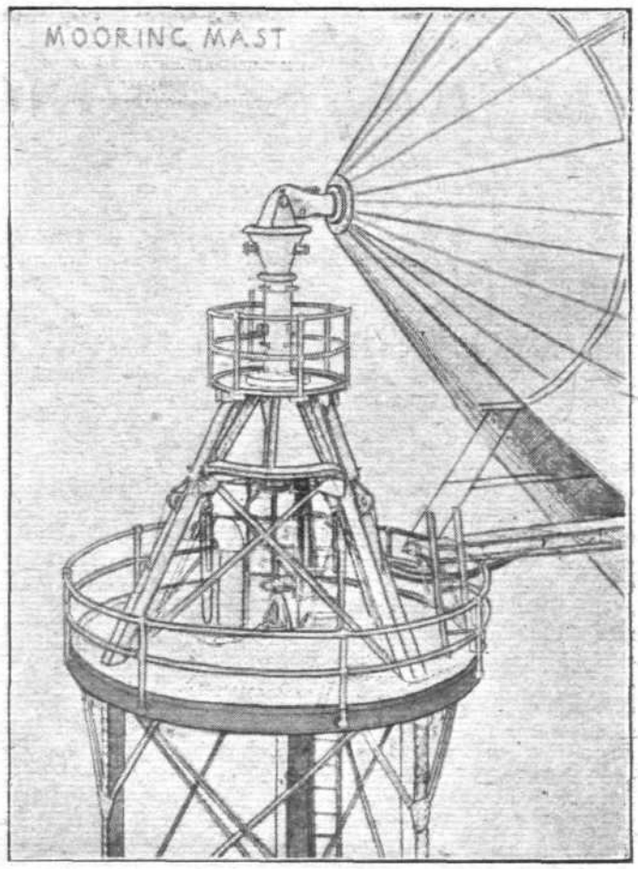
The elevator or lift runs in an interior rectangular framework to a platform 136 ft. above the ground. From this a ladder extends 12 ft. upward to the main operating platform. Above this, at 160 ft., is a third platform carrying the gimbal of the upper mooring gear proper.

Up the tower leads a pipe line for delivering 18,000 lbs. of water per hour, whilst another delivers fuel at the rate of 1,500 gallons per hour. A 12-in. pipe, with fabric tube lead to the ship, delivers 300,000 cubic ft. of gas per hour under 1 in. pressure. The connections for the gas, fuel oil and water, together with the ship attachment, are on the upper platform.

Surrounding the tower, on the ground, is a circle 1,000 ft. in diameter of 48 snatch block anchorages, spaced at equal intervals. Each anchorage has a heavy U-bolt for taking a snatch block. There are also provided additional anchorages for snatch blocks or fair lead sheaves to make it possible to lead two lines from any two of the guy line snatch blocks 120° apart to the two auxiliary winches in such a direction as to feed properly.

In docking, a ship is brought into the wind and approaches the mast. At a convenient distance, her main hauling line is let go through the ship's cone. This line is then coupled on by the landing crew to a main hauling line which runs from the main winch, up the tower, and has been dropped from the cup at the top of the mast to the ground, where it meets the ship's line. The slack is then taken up by the main winch, and the ship gradually pulled toward the mast head by electric power.

After this hauling-in has begun, and when the bow of the ship is near the circle of snatch block anchorages, two guy lines are dropped from the cone of the ship and coupled on to corresponding lines from the auxiliary winches. These lines lead from the winches in the base of the tower to the snatch blocks, which are 60° on either side of the direction of the wind, through such fair lead sheaves as may be necessary to make the lines feed properly on the winches, also operated by electricity. These latter are run until a mark on each line appears at the corresponding snatch block, when the auxiliary winches are stopped, the lines being simply held. At this point, there is just sufficient line between the snatch blocks and the ship's bow so that the ship's cone can be brought into the cup on the ram of the mooring gear at the top of the mast. The main hauling line continues to



THE U.S. NAVY AIRSHIP MOORING MAST : Sketch of the masthead, showing main platform, gear, gangway, etc.

draw the ship forward and down until the ship's cone enters the revolving cup.

Hauling is then continued at reduced speed, while a spring in the ram is compressed until the latter has entered the outer tube, a distance of about 5 ft., when it latches itself in the "in" position. The main hauling winch is then stopped. With the ship attached to the revolving cup and the ram in the "in" position the hand winches on the main platform are operated and the ram brought to a vertical position. Rod stays are then put in place and tightened up, fixing the ram and tube in this vertical position. The centring lines are then slacked off, and the ship rides to the structure of the mast alone.

The two guy lines are released from their winches and the ship's portions withdrawn into the ship. The latter then overhauls the main hauling line, withdrawing it up the mast and into the body of the ship until the coupling to the winch appears on the operating platform. Hauling is then

stopped, and the winch line is secured so that it cannot fall down the mast when the coupling is broken. A light line is then attached to the ship's half coupling, and the hauling line completely withdrawn into the ship.

Passengers, baggage, etc., may then pass over a gangway let down from the bow of the ship to the main platform of the tower, where it rests on a portable pad to prevent chafing.

In leaving the mast, the ship is trimmed sufficiently light to rise as soon as it is released from the mast, the releasing hook is opened and the ship rises, and the mast is again ready to receive.

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THE DE BOTHEZAT HELICOPTER

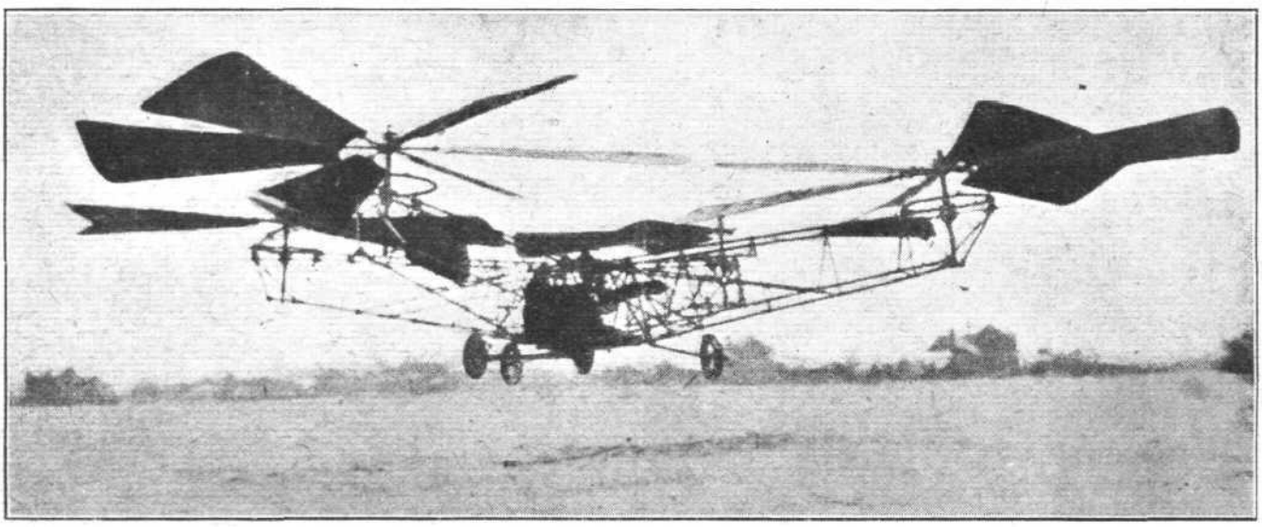
JUST recently reports have been coming along of several successful flights of some of the experimental helicopters with which various inventors, in different parts of the world, are attempting to solve the problem of direct lift and hovering. One of these, which appears to be making a certain amount of progress towards success, is the de Bothezat. According to our American contemporary *Aviation*, it accomplished its first free flight at the Headquarters of the Engineering Division at McCook Field, Dayton, Ohio, on December 18 last. The duration of this flight was 1 min. 42 secs., and the altitude reached about 6 ft. The helicopter rose straight from the ground, and then was manœuvred at the will of the pilot, and then descended, landing safely and easily. The machine was steady during this flight, showing a high degree of stability, and no difficulty was experienced in landing. The flight was witnessed by many Army officials and others.

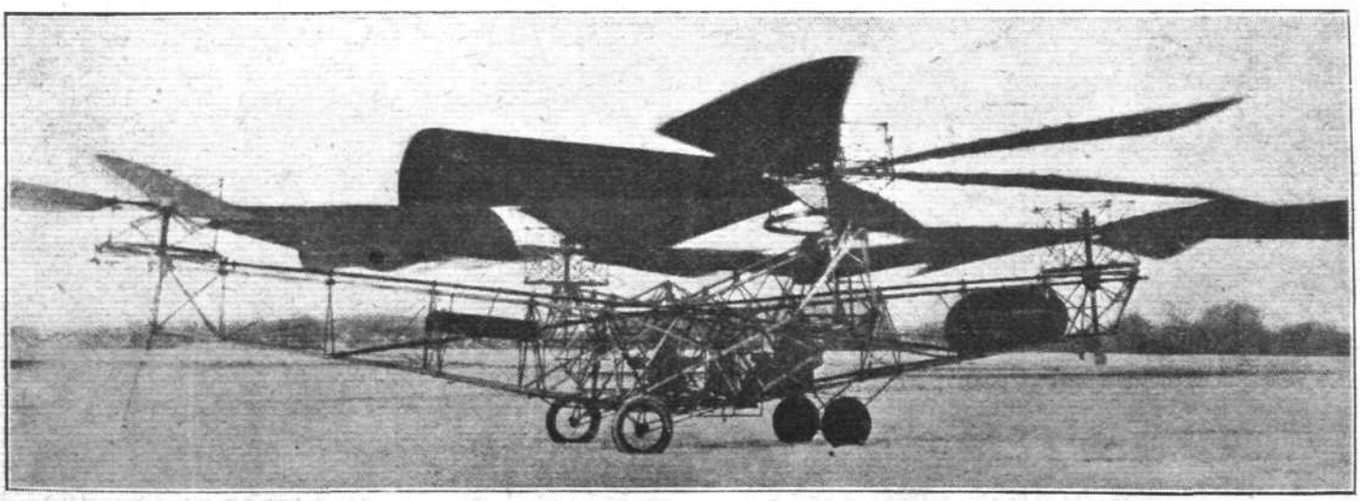
This helicopter was designed by Dr. G. de Bothezat and built, under his personal supervision, by the U.S. Air Service.

As may be seen from the accompanying illustrations, the de Bothezat helicopter consists of a cruciform framework, or fuselage, supported on a four-wheel chassis, and having at the extremity of each arm of the "body" a large six-bladed lifting screw—or, practically speaking, six lifting planes arranged radially. These are rotated through a special shaft gearing designed by Dr. de Bothezat by a 170 h.p. Le Rhone engine mounted in the centre of the body. The working of this gearing has been quite satisfactory. The total blade area of the lifting screws is 900 sq. ft., and their diameter 25 ft. The total weight of the helicopter is 3,600 lbs., including pilot and fuel. This machine was built full size, without preliminary models or tests of any kind, all of the details of the construction being based upon computations made by Dr. de Bothezat and in accordance with his general theory of helicopter stability.

The construction of the helicopter took only eighteen months, including the work of designing, building and all adjustments and tests. During its first successful flight it was piloted by Major T. H. Bane, who had been in charge of the Engineering Division while the machine was being designed and built.

During further trials, on January 19, it lifted two persons—Major Bane, the pilot, and Art Smith, the well-known civilian pilot—to a height of about 4 ft. In this weight the total weight lifted was 3,750 lbs., or 450 lbs. in excess of its designed gross weight. After this test several other flights were made by Major Bane and Art Smith individually. The maximum height reached was 10 ft. The engine, it may be noted, was never given full throttle. It is claimed that this machine can travel horizontally as well as vertically, and that it will glide to earth without danger in the event of engine trouble, as the projected area of the blades, when turning free, slow down the descent to a safe speed.





The de Bothezat Helicopter, built by the U.S. Air Service, which recently made several successful flights at McCook Field, Dayton. It is fitted with a 170 h.p. Le Rhône engine.

LONDON TERMINAL AERODROME

Monday evening, February 26, 1923

THE new service to Birmingham was commenced on Tuesday last, and has been fairly successful, quite a number of passengers making use of the Daimler machines flying from Manchester to Birmingham. From London to Birmingham the service has not been particularly well patronised, owing to the small saving of time, and, of course, to the uncertainty of the weather at this time of the year. When the Duke of York visited the Industries Fair at Birmingham on Thursday, one of the Daimler machines was at Birmingham throughout the day, and took up the Right Hon. Neville Chamberlain, the Postmaster-General, and several Birmingham notabilities for short flights.

A new D.H. 34, painted in the usual Instone blue, has been delivered to the Instone Air Line during the week, and will be put on the service shortly. In the meantime it is being housed in the Air Ministry sheds, as the Instone shed is full to overflowing with machines of all kinds—few of which ever take the air. This Air Line is, in fact, now relying entirely on its De Havilland flying stock for maintaining the London–Brussels–Cologne service, the rest of its miscellaneous fleet being, so to say, land-bound.

Aircraft Disposal Company Busy

THERE has been considerable activity during the week over at the Aircraft Disposal Company, several of their machines having been flying round the aerodrome and giving exhibitions of stunting. I understand that they are still turning out machines in large numbers for various of the smaller foreign powers throughout the world—there being no sign of any diminution in the demand for these rebuilt war-type machines.

On Thursday last, Mr. Alan J. Cobham left on another of his long flights, his programme this time being to fly to India by way of Monte Carlo and Cairo, and back again through Central Europe. I understand that the trip is by way of a propaganda flight for the De Havilland productions, and that Mr. Cobham will call on the various agents and give demonstrations.

Night-flying has been chiefly conspicuous by its absence, and has apparently petered out. The aerodrome is occasionally illuminated, but each time appears to be a false alarm, and nothing further happens.

One of the most violent thunderstorms in the history of the aerodrome broke on Wednesday just as the Handley Page machine for Paris was taking off, and the machine climbed straight into the storm. Hailstones of enormous size fell with such rapidity that the ground was quickly covered to a depth of two or three inches. So big were the hailstones that the noise of their fall on the roofs of the aerodrome buildings was like machine-gun fire, and fears were expressed for the fabric of the Handley Page and for the propellers. The pilot, however, managed to get out of the storm, and reached Paris in scheduled time. A Daimler machine flying from Manchester to Croydon encountered similar storms to the north of London, and flew out of its course for twenty minutes in order to work round them.

A 14-Passenger Handley Page

THE Handley Page Company are altering one of their W.8's in the sheds at Croydon, converting it to carry two extra passengers, which, with the addition of the pilot and mechanic, will make a total of sixteen people. The machine is nearly finished, and will be tested shortly, when it will be the biggest passenger 'plane on the airways.

The three petrol companies are brightening up again. The Shell office has now a gaudy lamp at its entrance, with the words "Shell" and "In" painted on it. There is no corresponding lamp to show the way out, but, as this leads direct to the Trust House, it is perhaps unnecessary. The Anglo-American have now fixed curtains in the windows of the office which was built for them some months ago, and is still unoccupied. The British Petroleum Company have finished their bulk petrol installation at the side of the Handley Page shed in order that the H.P. machines can be filled before they are brought round to the departure platform.

I am informed that the Surrey Flying Services have received an order from Spain for four D.H.9's, which they are erecting on the aerodrome, and which will be flown out to Spain, the first two being due to depart this week.

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HONOURS

AT the Investiture held by H.M. the King at Buckingham Palace on February 22, amongst those in attendance was Air Chief Marshal Sir Hugh Trenchard, Bart. (Principal Air Aide-de-Camp). The following were investigated with the Insignia of the respective divisions of the Orders into which they have been admitted :—

The Royal Victorian Order

Knight Grand Cross : The Duke of Atholl.

The Most Honourable Order of the Bath

Companions, Military Division : Air-Commodore Edward Masterman and Group-Captain Malcolm Bonham-Carter.

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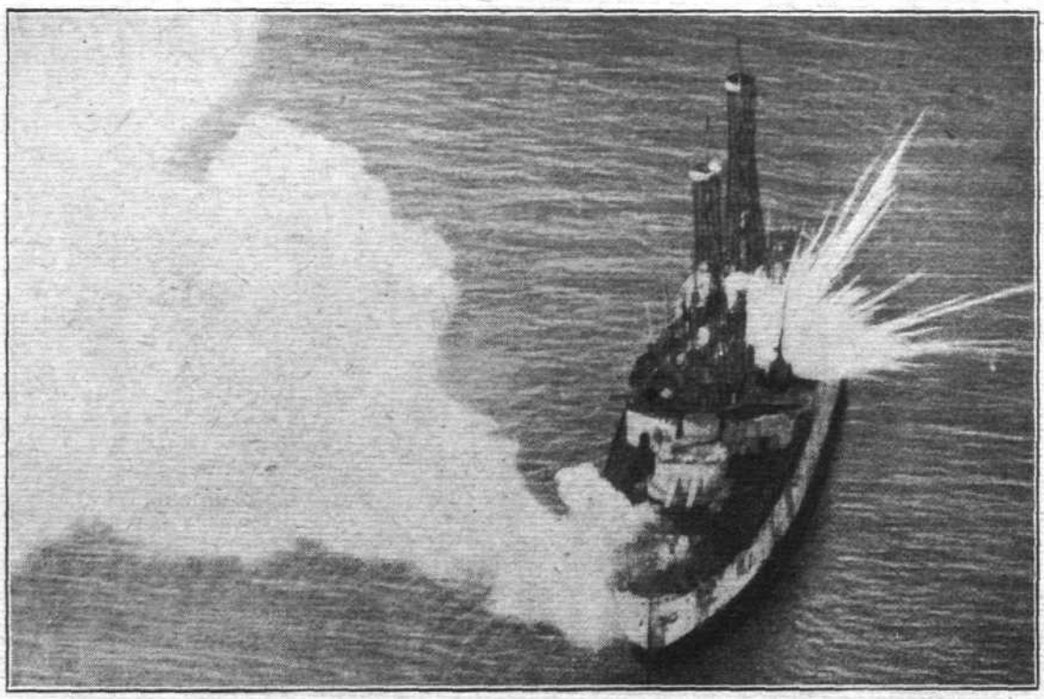


What is the use of a Battleship? The above U.S. Navy official photo. shows the "Alabama" receiving a couple of visiting cards from an aeroplane.

FLIGHT

THE ROYAL AIR FORCE

London Gazette, February 20, 1923

General Duties Branch

Observer Offr. W. C. Day, M.C., is granted permanent commission in rank stated; Oct. 24, 1919 (since promoted). *Gazette*, Oct. 24, 1919, appointing him to short service commission, is cancelled.

The follg. are granted short service commns. as Flying Offrs., with effect from and with seny. of dates indicated:—E. Bell; Feb. 12. J. M. Burd, M.C.; Feb. 7. Sqdn. Ldr. C. C. Miles, M.C., is restored to full pay from half-pay; Feb. 15.

Stores Branch

J. V. Mason, A.M.I.M.E., is granted a short service commn. as a Flight Lieut. for three years' service on the active list, with seny. of May 15, 1919; Feb. 19. Sqdn. Ldr. T. L. Stevens is placed on the retired list; Feb. 20.

Reserve of Air Force Officers

Flying Offr. S. L. Cannon is transfd. from Class A to Class C; Feb. 20.

Memoranda

Lieut. F. C. Berkeley relinquishes his temp. commn. on ceasing to be emplyd., and is permitted to retain his rank; April 14, 1919. The permission granted to Lieut. G. H. Taylor to retain his rank is withdrawn on his enlistment in the R.A.F.; Feb. 5.

London Gazette, February 23, 1923

General Duties Branch

The follg. is transfd. to the Reserve (Feb. 24):—*Class C.*—Flying Offr. A. E. Hempel.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the R.A.F. are notified:—

Air Commodore: C. R. Samson, C.M.G., D.S.O., A.F.C., from Headquarters, R.A.F., Mediterranean, to R.A.F. Depot (Inland Area) (Supernumerary). 2.2.23.

Wing Commander: J. T. Cull, D.S.O., from Headquarters, Coastal Area, to Headquarters, R.A.F., Mediterranean. 23.1.23.

Squadron Leaders: C. C. Miles, M.C., from Half-pay List to R.A.F. Base, Gosport (No. 3 Squadron) (Coastal Area), to command No. 3 Squadron. 15.2.23. J. T. Whittaker, M.C., from Headquarters, No. 12 Wing, Ireland, to command No. 39 Squadron (Inland Area). 8.2.23. E. R. L. Corballis, D.S.O., from Central Flying School (Inland Area), to command No. 24 Squadron (Inland Area). 12.2.23.

Flight Lieutenants: F. W. Walker, D.S.C., A.F.C., from Seaplane Training School (Coastal Area) to R.A.F. Base, Leuchars (No. 205 Squadron) (Coastal Area). 15.2.23. J. W. B. Grigson, D.S.O., D.F.C., from Seaplane Training School (Coastal Area), to R.A.F. Base, Leuchars (No. 205 Squadron) (Coastal Area). 15.2.23. W. C. Clark, from Headquarters, No. 12 Wing, Ireland, to R.A.F. Depot (Inland Area). 7.2.23. J. K. R. Landells, M.B., from Headquarters, No. 12 Wing, Ireland, to No. 1 School of Technical Training (Boys) (Halton). 7.2.23. H. K. Thorold, D.C., D.F.C., A.F.C., from No. 84 Squadron (Iraq Command), to No. 4 Flying Training School (Middle East). 14.1.23. F. J. Vincent, from No. 1 Squadron (Iraq Command), to No. 4 Flying Training School (Middle East). 14.1.23. W. E. Hodgins, M.B. The entry concerning this officer which appeared in R.A.F. Bulletin No. 103, dated 31.1.23, is hereby cancelled. A. J. Long, from M.T. Repair Depot (Inland Area), to School of Technical Training (Men) (Inland Area). 26.2.23. H. S. P. Walmsley, M.C., D.F.C., from No. 55 Squadron (Iraq Command), to R.A.F. Depot (Inland Area) (Supernumerary). 14.1.23. F. Petch, O.B.E., from Inland Area Aircraft Depot (Inland Area), to No. 11 Wing Headquarters (Inland Area) (Supernumerary). 26.2.23.

Major and Ordnance Officer (3rd Class): C. H. Saunders, C.M.G. (R.A.O.C.), to Ordnance Depot (Palestine Command), on attachment to Royal Air Force. For duty as Chief Ordnance Officer. 23.1.23.

IN PARLIAMENT

Airship Service

CAPT. W. BENN, on February 20, asked the Financial Secretary to the Admiralty whether the Board has considered any plan for paying out of Navy funds a subsidy to an airship service?

Commander Eyres-Monsell: Yes, Sir. The question has been under consideration.

Air Services (Control)

CAPT. WEDGWOOD BENN asked the Prime Minister whether it is proposed to confer on the Admiralty, in return for a subsidy, any control over civilian airships; and whether it is the policy of the Government that unity of control of air services under the Air Ministry should be maintained?

The Prime Minister: In reply to the first part of the question, the matter is still under consideration. As regards the second part of the question, I would refer to the answer which I gave yesterday.

Capt. Benn: Has the Admiralty been in negotiation in reference to a subsidy for airships, and, if so, by what authority?

R.A.F. Bands Engagements

MR. HAYDAY, on February 21, asked the Secretary of State for Air whether he is aware that the Royal Air Force orchestra attached to the Cranwell Cadet College is to be regularly engaged to play at the Picturedrome, Sleaford, Lincolnshire; that two civilian musicians have received notice of discharge in consequence; and that this orchestra of 15 persons has secured the contract by reason of the fact that their remuneration will not exceed that paid to the two civilian musicians; whether consent has been given to this orchestra to enter into a contract of this character; and whether he will give instructions that these bands shall not take engagements which will have the effect of throwing civilian musicians out of employment?

Sir S. Hoare: The Regulations for the Royal Air Force Music Services lay down that Royal Air Force bands are to be allowed to accept engagements only when the rates paid are at least equal to those received by civilian bands in the locality concerned. Commanding officers are required to familiarise themselves with the rates paid to civilian bands before allowing service bands to enter into any contracts. Subject to the provisions of this Regulation, engagements are left in the hands of the Commanding Officer on the spot. I have no details of the arrangements stated to have been made at Sleaford, but I am making enquiries, and will communicate with the hon. member.

The Stanmore Accident

WHEN the inquest was resumed, on February 27, at Edgware on the two victims of the accident to a de Havilland machine at Stanmore on January 10, in which Major Keys, a pilot, and Mr. Arnell, a mechanic, were killed, the Coroner said he would return a verdict that the two men met their death as the result of the aeroplane crashing owing to trying to turn without having sufficient flying speed.

Duralumin—A Correction

IN our Editorial Comment in FLIGHT of February 8, 1923, we referred to the subject of metal construction, and, in speaking of Duralumin, stated that "In this country we are not using Duralumin at all." Taken by itself, that statement is, of course, inaccurate, as Duralumin *is* used to a considerable extent. Read in connection with the context, however, it should have emerged that our reference was to the use of Duralumin for rolled, drawn or pressed sections such as are used on French machines built of this material, and on British machines built of sheet steel. Mr. Oswald Short writes to us, pointing out the error, and calling our attention to the extensive use of Duralumin in the Short "Silver Streak" and its latest developments. To be perfectly clear, what we should have said in our notes was that in this country Duralumin is not used at all for highly-stressed parts. Even in the Short machine such components as wing spars are in the form of steel tubes, and the principles of construction employed are rather different from those of other designs. However, we have every pleasure in correcting any wrong impression that may have been inadvertently conveyed, and to place on record the fact that the Duralumin used in the peculiar Short way has given every satisfaction both as regards strength and durability, and that as a result Short's have received an order for further machines built on the same principle.

Civil Aviation in Australia

AUSTRALIA has shown considerable enterprise in the encouragement of aerial routes. For the first established of these, conducted by the Western Australian Airways, Ltd., is claimed the distinction of being the most efficient air line in the world. In regular operation since April, 1922, the service to the end of the year was maintained with 97 per cent. regularity along the 1,195-mile route from Geraldton to Derby. During that period, 86,000 miles were flown and 70,000 letters were carried, whilst valuable freight averaged 600 lbs. per month. Much of this was from the pearl fisheries of the north-western coast. The growing popularity of this regular and speedy service is evidenced by the fact that the 4,000 letters carried in April had increased to 12,000 in November. As to the saving of time, it need only be mentioned that the eleven days occupied in the trip by coastal steamer from Perth to Broome is reduced to two days if the air line is used from Geraldton. The value of the service is so appreciated that local interests are pressing for the route to be extended a further 300 miles to Wyndham. The type of aircraft in use on this route is the well-known "Bristol" three-seater Tourer, and the proprietors have expressed the highest satisfaction with the excellent service which the machines have given.

America's Zeppelin

IT is reported that the Zeppelin airship which is being built for the United States at Friedrichshafen is expected to be finished in April of this year, and that the first trial flights may be expected to take place in May. In June it is contemplated to make a flight to Berlin, and afterwards the ship will be stationed at Staaken, whence the flight to America will probably take place later in the year. On its arrival in America the ship will, it is stated, be stationed at Chicago, where a large shed is being built for it.

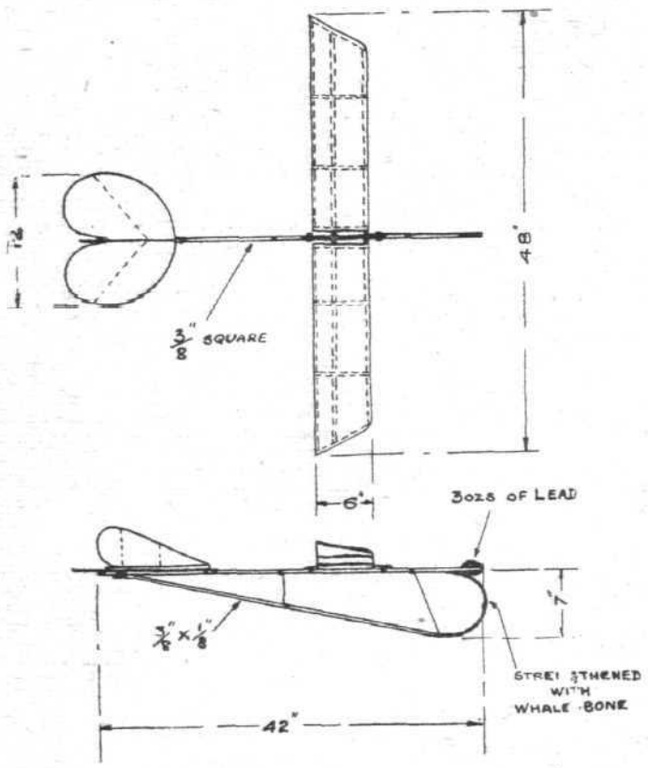
MODELS

THE JOHNSON MODEL GLIDER

FROM the reports of the proceedings of the Society of Model Aeronautical Engineers, which appear in FLIGHT from time to time, readers will have noticed that at some of the Society's meetings, held during the last few months at various places, competitions have been held for model gliders, and that some very successful glides with these models have been obtained.

There is every indication that " model gliding " is becoming a very popular section of the Society's activities, and from our own experience of model gliders this in not surprising, for given suitable conditions a considerable amount of information and amusement may be gained from them, not only in evolving an efficient type of glider, but, having obtained the latter, in observing its behaviour under varying conditions and in different air currents.

In order to give those of our readers who may be interested in this side of model work an idea as to the form these model gliders take, we propose publishing drawings of some successful types, constructed by members of the S.M.A.E.,



GLIDER "ALBATROSS"
(B.K. JOHNSON.)

and this week we show a monoplane glider built by Mr. B. K. Johnson—the " Albatross."

As will be seen, it is of the simplest construction, and we have little to add to what is already told in the illustration, other than that the model is balanced longitudinally by a piece of lead in the nose of the fuselage, and that finer adjustment may be obtained by sliding the wings back or forward. It will be noticed that the upper and lower longerons are joined at their forward ends by a piece of whalebone, curved round to meet the two ends. Besides strengthening the fuselage, this acts as a good shock absorber.

The principal characteristics of this glider are :—

Weight	10 ozs.
Area of main plane	276 sq. ins.
Area of tail plane	115 sq. ins.
Area of fin	25 sq. ins.
Loading per sq. ft.	5¼ ozs.
Weight of lead	3 ozs.
Best duration (officially timed) ..	35⅕ seconds
Best duration (unofficially timed)	40 seconds.

Stability, extremely good.

* * * *

Aviation in Switzerland

DURING 1922 Swiss military aviators made 19,923 flights, covering 414,063 miles in 5,620 hours' flying time. The only casualties were one child killed by a landing machine, two pilots injured, and four machines damaged.

PUBLICATIONS RECEIVED

Atti dell' Associazione Italiana di Aerotecnica, 1922. *Vol. II, No.* 1-2. Associazione Italiana di Aerotecnica, Lungotevere Michelangelo, 10, Rome. Price 10 lire.

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No. 705 (Ae. 25). Experiments on Complete Models of Six Aeroplanes. By E. F. Relf and E. Ower. October, 1920. Price 1*s*. 9*d*. net.

No. 778 (Ae. 36). An Electric Motor of Small Diameter for Use Inside Aeroplane Models. By E. R. Relf. January, 1922. Price 2*d*. net.

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No. 121. Further Information on the Laws of Fluid Resistance. By C. Wieselsberger. December, 1922.

No. 122. The Determination of the Angles of Attack of Zero Lift and of Zero Moment, based on Munk's Integrals. By Max M. Munk. January, 1923.

* * * *

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations : cyl. = cylinder ; I.C. = internal combustion ; m. = motor
The numbers in brackets are those under which the specifications will be printed and abridged, etc.

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Published March 1, 1923

22,917. INTERNATIONAL ALL-STEEL AIRCRAFT SYND., LTD., and H. BOLAS. Aircraft. (192,431.)
29,416. H. LEITNER. Metal airscrews. (192,498.)
29,950. H. C. PEIRCE. Connecting device for parachutes. (192,512.)
31,103. C. D. BROOKS. Screw propellers. (192,528.)
33,340. H. T. W. SMITH. Joints for structural members of aircraft. (192,552.)

APPLIED FOR IN 1922

Published March 1, 1923

122. A. and H. O. SHORT, O. T. GNOSSPELIUS and A. GOUGE. Wings and other aerofoils. (192,568.)
26,008. VICKERS, LTD., and O. D. LUCAS. Means for controlling fire of automatic guns carried by aircraft. (192,675.)

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